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Disparities in Retail Marketing for Menthol Cigarettes in the United States, 2015

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Abstract

This study describes retail marketing for menthol cigarettes and its relationship with neighborhood demographics in a national sample of tobacco retailers in the United States. Mixed-effects models were used to examine three outcomes: menthol cigarette exterior advertising, menthol cigarette price promotions, and the pack price of menthol and non-menthol cigarettes. Thirty-eight percent of retailers displayed at least one menthol advertisement on the store exterior and 69% advertised price promotions. Retail advertising was more common in neighborhoods in the second (OR=1.5 [1.1, 2.0]) and fourth (OR=1.9 [1.3, 2.7]) quartiles of Black residents as compared to the lowest quartile. Menthol advertising was more prevalent in the third (OR=1.4 [1.0, 1.9]) and lowest (OR=1.6 [1.2, 2.2]) income quartiles as compared to the highest quartile. Price promotions for Newport were more common in neighborhoods with the highest quartile of Black residents (OR=1.8 [1.2, 2.7]). Prices of Newport were cheaper in neighborhoods with the highest quartiles of youth, Black residents, and lower-income households. Policies that restrict the sales and marketing of menthol cigarettes are needed to address disparities.

Keywords

Menthol; Tobacco; Health Disparities; Retail Marketing

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Declaration of Interest

All other authors declare no conflicts of interest.

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Smoking is the leading cause of preventable death in the United States (US), responsible for more than 480,000 deaths per year (US Department of Health and Human Services, 2014). Thirty-nine percent of smokers in the US use menthol cigarettes (Villanti et al., 2016). Menthol is an organic compound that can provide anesthetic and cooling effects when added to cigarettes (Tobacco Products Scientific Advisory Committee, 2011). The local anesthetic effects are thought to come from blockade of pain receptors on skin and mucosal surfaces, such as the lining of the mouth and throat (Ahijevych & Garrett, 2004). Stimulation of cold receptors on these surfaces are believed to be responsible for the cooling effects, felt in several areas of the body. Historically marketed as providing therapeutic benefit, menthol cigarettes were portrayed as healthier than non-menthol cigarettes (Anderson, 2011; Samji & Jackler, 2008), and a recent study found that 7% of menthol smokers believe their brand is less harmful than others (Cohn et al., 2018), despite research suggesting the opposite. The analgesic and cooling effects of menthol help to mask the harshness of cigarette smoke, allow for deeper inhalation of harmful constituents and provide additional reinforcing properties to cigarettes (Gardiner & Clark, 2010). In 2011, the Tobacco Products Scientific Advisory Committee, a Congressionally mandated committee to advise the US Food and Drug Administration (FDA) Center for Tobacco Products, concluded that menthol increases smoking initiation and makes cigarette smoking more difficult to quit (Tobacco Products Scientific Advisory Committee, 2011). Simulation modeling suggests that from 2011 to 2050 an estimated 633,252 smoking-attributable deaths in the US would be averted if menthol were removed from the market (Levy et al., 2011).

The prevalence of menthol smoking is higher among youth, Black, Hispanic, Asian, and low-income smokers, and those with serious mental illness (Corey, Ambrose, Apelberg, & King, 2015; Villanti et al., 2016; Young-Wolff, Hickman, Kim, Gali, & Prochaska, 2015). In 2014, approximately half (54%) of middle and high school student smokers smoked menthol cigarettes (Corey et al., 2015). In 2012–2014, 85% of Black, 47% of Hispanic, and 38% of Asian smokers used menthol cigarettes, as compared to only 29% of non-Hispanic White smokers (Villanti et al., 2016). Menthol smoking also differs by household income: 44% of smokers with incomes less than \$30,000 used menthol cigarettes as compared to 32% of smokers with household incomes of \$75,000 or more (Villanti et al., 2016). In a recent sample of adult smokers with serious mental illness, 57% used menthol cigarettes (Young-Wolff et al., 2015).

Disparities in menthol use may be related to disproportionate retail marketing of menthol cigarettes in areas where these groups reside. “Racialized geography,” or the interaction between race, class, and place, has been used to explain the tobacco industry’s retail marketing practices that targets groups according to race/ethnicity and socioeconomic status (Yerger, Przewoznik, & Malone, 2007). Groups of individuals with similar racial/ethnic and socioeconomic backgrounds tend to live near each other (Frey, 2015; Fry & Taylor, 2012). This segregation can facilitate segmentation of a consumer base and allow for targeted retail marketing according to neighborhood demographic characteristics (Author, 2017). In 2015, the largest tobacco companies allocated \$8.2 billion to market cigarettes and discount prices, and 91.5% of these expenditures were concentrated in the retail environment (Federal Trade Commission, 2017). Retail marketing includes store advertising, such as placing tobacco company branding on store exteriors, and offering price discounts and special promotions,

such as buy one get one free deals (Author, 2012). Exposure to retail cigarette marketing has been associated with smoking initiation among youth, as well as brand preference, greater cravings for cigarettes, more impulse buys, fewer quit attempts and more relapse among adults (Choi, Hennrikus, Forster, & St. Claire, 2017; Kirchner et al., 2013; Paynter & Edwards, 2009; Author, 2008).

Retail Advertising for Menthol Cigarettes

Previous studies provide strong evidence of more retail advertising for menthol cigarettes in neighborhoods with more Black residents (Laws, Whitman, Bowser, & Krech, 2002; Author, 2015; Moreland-Russell et al., 2013; Pucci, Joseph, & Siegel, 1998; Seidenberg, Caughey, Rees, & Connolly, 2010; Widome, Brock, Noble, & Forster, 2013). For example, in the Midwest, a 10% increase in the African American/Black population of a census block group was associated with 26% more menthol advertisements in stores (Widome et al., 2013). Targeted retail advertising parallels previous menthol marketing to Black residents through other channels, such as billboards and tobacco industry sponsorships of community events in Black neighborhoods (Altman, Schooler, & Basil, 1991; Hafez & Ling, 2006). Research on the relationship between retail advertising for menthol cigarettes and other racial/ethnic compositions of neighborhoods is more limited. In Boston, two studies found retail advertising for menthol brands heavily concentrated in Latino neighborhoods (Laws et al., 2002; Pucci et al., 1998). In Minnesota counties, more retail menthol advertisements were associated with a higher percentage of Black residents and a lower percentage of White residents, but not with the percentage of Hispanic or Asian residents (Widome et al., 2013).

Studies also find that retail advertising for menthol cigarettes varies by neighborhood characteristics related to youth and socioeconomic disadvantage. In California, more retail advertising has been documented near schools with more Black students and in areas with a greater proportion of school-age youth (Author, 2012). In St. Louis, Missouri, areas with more Black youth have more stores with retail menthol advertising near candy (Moreland-Russell et al., 2013). More retail advertisement for menthol were also found in neighborhoods with greater socioeconomic disadvantage in Ramsey and Dakota counties, Minnesota (Widome et al., 2013) and in Boston, Massachusetts (Laws et al., 2002; Seidenberg et al., 2010). Much of the research has focused on specific states, counties or cities. These studies, however, can only assess the demographic variation reflected in those specific locations, and may not generalize to other areas.

Menthol Cigarette Price Promotions and Pack Price.

Some studies have examined relationships between price promotions for menthol cigarettes and neighborhood demographics. Such promotions have been shown to be more common in New York and California neighborhoods with a higher proportion of youth (Author, 2012; Waddell, Sacks, Farley, & Johns, 2016) and near California schools with a higher proportion of Black students (Author, 2012).

More studies have examined relationships between the price of menthol cigarettes and neighborhood demographics, but the findings are not consistent. In two California samples,

Newport menthol prices were lower in areas with more Black students (Author, 2012) and residents (Author, 2016), but another study in California found prices were not related to the proportion of Black residents (Lipperman-Kreda, Grube, & Friend, 2014). There is also some evidence of lower prices for Newport cigarettes in areas with more Asian/Pacific Islander (Asian/PI) residents (Author, 2016), and higher prices in areas with more Hispanic residents (Lipperman-Kreda et al., 2014), but these findings have not been replicated. Cheaper prices for Newport cigarettes were also found in areas with more youth in US and California samples, but price for an unspecified brand of menthol cigarettes was not associated with the percentage of the population that was non-White or youth in Minneapolis-St. Paul, Minnesota (Toomey, Chen, Forster, Van Coevering, & Lenk, 2009).

To date, a growing body of literature demonstrates that retail marketing for menthol cigarettes targets youth, ethnic minority, and low-income populations (Author, 2016, 2012; Author, 2015; Young-Wolff et al., 2015). However, much of this research has been conducted in single states or smaller regions and is limited to study of a single menthol brand. The research on menthol prices and promotions often examines Newport because it is the leading menthol brand, and the cigarette brand preferred by the majority of Black smokers (Giovino et al., 2013; Sharma, Fix, Delnevo, Cummings, & O'Connor, 2016). However, it is not known whether neighborhood variation in price promotions is unique to Newport or whether it also occurs for menthol varieties of Marlboro and Camel (Sharma et al., 2016; Tobacco Products Scientific Advisory Committee, 2011). The present study is the first to compare price promotions across the three leading brands of menthol cigarettes. It also examines neighborhood variation in the price of the leading menthol and non-menthol cigarette brands, Newport Full Flavor and Marlboro Red cigarettes, respectively, in a representative sample of US tobacco retailers to assess where manufacturer retail marketing strategies may diverge. Furthermore, examining relationships between neighborhood demographics with price and promotions in a broader geography may help clarify prior conflicting findings.

Previous studies have also been limited by focusing only on main effect relationships between neighborhood demographic characteristics and retail marketing for menthol cigarettes. Examining the interplay between neighborhood demographic characteristics such as racial/ethnic demographic composition and median household income may be critical to better understanding tobacco industry retail marketing for menthol cigarettes.

Present Study

The present study describes menthol cigarette marketing in a representative sample of US tobacco retailers and examines associations with census tract measures of median household income, and percentages of youth, Black, Asian/PI, and Hispanic residents. This study aims to extend what is known about retail marketing for menthol cigarettes in three important ways: 1) by assessing whether relationships between retail menthol marketing and neighborhood demographics that were previously established in smaller geographies generalize to a national sample; 2) by examining neighborhood demographic characteristics that have been less studied and investigating potential interactions among neighborhood

demographic characteristics; and 3) by comparing relationships between marketing and neighborhood demographics across leading menthol cigarette brands.

Methods

Data for this study come from a national store audit study conducted by Advancing Science and Policy in the Retail Environment (ASPiRE), a consortium of researchers from three universities [university names and funding statement removed for peer review].

Sample

County and Store Selection—A two-stage sampling design was used to obtain a nationally representative sample of tobacco retail stores in the contiguous US. First, counties were selected using a probability proportionate to size method developed by Chromy (1979). US counties are geographical regions that are subdivisions of a state. Ninety-seven unique counties were selected from all 3,109 counties in the US, according to 2010 US Census population data. In the second stage, retailer data was purchased from Dun & Bradstreet and ReferenceUSA to create a retail store sampling frame using methods previously validated (Author, 2014). Using North American Industry Classification System store codes, ten store types were selected that accounted for most (98%) tobacco product sales in payroll establishments in the 2007 Census of Retail Trade (US Census Bureau). In the majority of counties, 24 tobacco retailers were randomly selected to be visited, resulting in a sample of 2,346 stores. Detailed description of the sampling strategy can be found in Author et al., 2017.

Data Collection—Trained data collectors used a standardized protocol to conduct exterior and interior store audits of tobacco retailers. Data collectors completed store audits in person using an electronic audit form developed for the study. The ASPiRE study consisted of three waves of data collection. This study presents data from Wave 3; data collection occurred from May 2015 to August 2015. The sample for Wave 3 was modified slightly from the baseline sample of tobacco retail stores to add Dollar Stores, which started selling cigarettes during the course of the study, and to drop CVS Pharmacies, which stopped selling tobacco products. Analyses were conducted on stores where exterior and interior audits were completed ($N = 2,124$; 98% of 2,157 eligible stores in Wave 3). The Office of Human Research Ethics determined that the study was not human subjects research [university name removed for peer review].

Measures

Three types of menthol cigarette marketing are examined: exterior store advertising, price promotions and price of a single pack.

Exterior advertising—Data collectors noted the presence or absence of menthol cigarette advertising on the store exterior (e.g., windows/doors or building; 1 = advertising present, 0 = no advertising).

Price promotions—Price promotions were defined as having a special price (e.g., 50 cents off a pack) or a multi-pack special price (e.g., buy one pack, get one free). Price promotions for menthol cigarettes were coded by product location (exterior or interior of store) and by brand (Newport, Marlboro, Camel). Price promotions for menthol cigarettes of each brand were categorized to indicate whether any price promotion was available at a store (exterior or interior) or no price promotion was available (1 = price promotion present, 0 = no price promotion).

Price—Data collectors noted the single pack price of Newport Full Flavor (menthol) cigarettes and Marlboro Red (non-menthol) cigarettes in US dollars and indicated whether sales tax was included. A single pack contained 20 cigarettes, as mandated by law in the US. Sales tax, when included in the recorded price, as well as state and local excise taxes were removed before analysis.

Census tract characteristics—Store neighborhoods were defined by census tract. Census tracts are small, stable subdivisions of counties that have a population size between 1,200 and 8,000 people (US Census Bureau). Census tract characteristics were obtained from the American Community Survey 5- year estimates (2011–2015): percent of the population that is Black, Asian/PI, Hispanic, youth (aged 5 to 17), and median household income. All racial/ethnic groups were non-Hispanic (except for the Hispanic group). Racial/ethnic group and youth census tract characteristics were quartiled from lowest to highest percentage. Census tract median household incomes were rank ordered within county, with quartiles ordered from highest to lowest median household income.

Store type—Stores were categorized by data collectors in the field and later consolidated into the following categories: gas convenience store; convenience store (without a gas station); drug store/pharmacy; supermarket/grocery store; mass merchandiser (including Wal-Mart and dollar stores); beer, wine, or liquor store; tobacco shop; and other (e.g., donut shop).

US region—Stores were categorized by region (West, Midwest, South, Northeast) according to US Census definitions (United States Census Bureau).

Data Analysis

First, we obtained estimates of 1) the presence of any exterior advertising for menthol cigarettes, 2) any price promotions for menthol cigarettes, and 3) pack price for Newport Full Flavor (menthol) and Marlboro Red (non-menthol) cigarettes. Next, we estimated mixed-effects models to examine these outcomes as a function of census tract demographics, controlling for store type and US region. We used mixed-effects generalized models for the categorical outcomes (advertising, price promotions) and linear models for the continuous (price) outcome. A mixed-effects model is used in the presence of correlated errors that arise when data are hierarchically nested or clustered (Steenbergen & Jones, 2002). Stores (level 1) were clustered within counties (level 2) to parallel the sampling design (Exterior Advertising: variance partitioning coefficient [VPC] = .09; Newport Promotion: VPC = .15; Marlboro Promotion: VPC = .24; Camel Promotion: VPC = .13; Newport Full Flavor

(menthol) price: intra-class correlation [ICC] = .25; Marlboro Red (non-menthol) price: ICC = .32). There was negligible clustering of stores within census tracts; 81% of census tracts had only one eligible store. Store observations and census tract variables were assigned to level 1 and US region was assigned to level 2. We also examined the potential interplay between census tract racial or ethnic group composition and median household income. Interactions terms were created among the following census tract demographic characteristics: 1) income and percent of the population that is Black, 2) income and percent of the population that is Asian/PI, and 3) income and percent of the population that is Hispanic. We tested the significance of these interaction terms in each mixed-effects model. Sampling weights were applied to the descriptive statistics only. The term neighborhood refers to the census tract of a tobacco retailer.

Results

Descriptive Statistics

In 2015, more than one-third (37.7%) of US tobacco retailers had exterior advertising for menthol cigarettes and the majority (69.3%) had menthol price promotions on the store exterior and/or interior (Table 1). More stores advertised price promotions for menthol varieties of Marlboro (50.1%) and Camel (48.0%) as compared to menthol varieties of Newport (27.6%).

The average single-pack prices for Newport Full Flavor (menthol) and Marlboro Red (nonmenthol) cigarettes, without taxes, were \$5.19 and \$4.96, respectively.

Menthol Cigarette Marketing, Store Type and Neighborhood Demographics

Advertising—The odds of a store advertising menthol cigarettes on the exterior were 1.5 (95% CI = 1.1, 2.0) and 1.9 (95% CI = 1.3, 2.7) times greater in neighborhoods in the second and fourth quartiles of Black residents, respectively, as compared to the lowest quartile (Table 2). The odds of having exterior advertising for menthol cigarettes were 1.4 (95% CI = 1.0, 1.9) and 1.6 (95% CI = 1.2, 2.2) times greater in the third and lowest income quartile as opposed to highest income quartile. Presence of exterior advertising for menthol cigarettes differed by store type and region as well. The odds were lower in drug stores/pharmacies, beer, wine, and liquor stores, and grocery stores/supermarkets as compared to gas convenience stores, but higher in mass merchandiser stores. The odds were 1.9 (95% CI = 1.1, 3.2) times greater in the Northeast as compared to the West.

Price Promotions—Neighborhood variation in menthol price promotions varied by brand (Table 2). The odds of a store displaying a Newport price promotion were 1.8 (95% CI = 1.2, 2.7) times greater among neighborhoods in the highest quartile of Black residents as compared to the lowest quartile, whereas the odds of a store displaying a price promotion for Marlboro menthol cigarettes were 1.6 (95% CI = 1.1, 2.4) times greater in neighborhoods in the highest quartile of Asian/PI residents as compared to the lowest quartile. There were no other differences in the odds of a price promotion by neighborhood demographic characteristics, including no differences in price promotions for Camel menthol cigarettes.

Price promotions for Newport, Marlboro, and Camel menthol cigarettes were more common in drug stores/pharmacies as compared to gas convenience stores. Stores in the South had 2.3 (95% CI = 1.1, 4.7) times greater odds of displaying a price promotion for Marlboro menthol cigarettes as compared to the West. The odds of a store displaying a price promotion for Camel menthol cigarettes were 2.0 (95% CI = 1.1, 3.6) times higher in the Midwest as compared to the West.

Single-pack price—Newport Full Flavor (menthol) cigarettes were generally cheaper in neighborhoods with more Black and youth residents, and in neighborhoods with lower median household incomes. Newport Full Flavor (menthol) cost \$0.09 (95% CI = −0.16, −0.02), \$0.08 (95% CI = −0.16, −0.01) and \$0.18 (95% CI = −0.27, −0.10) less in neighborhoods in the second, third and highest quartiles of Black residents as compared to the lowest quartile, respectively. Newport Full Flavor (menthol) cost \$0.12 (95% CI = −0.19, −0.06) and \$0.09 (95% CI = −0.16, −0.02) less in the third and highest quartiles of youth as compared to the lowest quartile, respectively. Newport Full Flavor (menthol) cost \$0.10 (95% CI = −0.16, −0.03), \$0.07 (95% CI = −.13, −0.00) and \$0.15 (95% CI = −0.23, −0.08) less in the second, third, and lowest income quartiles as compared to the highest income quartile. Newport Full Flavor (menthol) cost \$0.11 (95% CI = 0.02, 0.19) more in neighborhoods in the highest quartiles of Asian/PI residents as compared to the lowest quartile (see Table 3).

Marlboro Red (non-menthol) prices were also cheaper in neighborhoods with greater proportions of Blacks, youth, and in neighborhoods with lower median household incomes. Marlboro Red (non-menthol) cost \$0.08 (95% CI = −0.14, −0.02) less in neighborhoods in the second quartile of Black residents as compared to the lowest quartile. Marlboro Red (nonmenthol) also cost less in neighborhoods with the second, third, and highest quartiles of youth as compared to the lowest quartiles of youth, respectively (price differences range from \$0.07 to \$0.11 for youth). In addition, Marlboro Red (non-menthol) cost \$0.07 (95% CI = −0.13, −0.02), \$0.07 (95% CI = −0.13, −0.01), and \$0.09 (95% CI = −0.16, −0.03) less in neighborhoods in the second, third, and lowest quartiles of income as compared to the highest quartile, respectively.

Both of the Newport Full Flavor (menthol) and Marlboro Red (non-menthol) packs that were studied cost less in drug stores/pharmacies, mass merchandisers, and tobacco shops, as compared to gas convenience stores, with price differences ranging from \$0.14 to \$0.25.

Newport Full Flavor (menthol) and Marlboro Red (non-menthol) cost more in beer, wine, and liquor stores and grocery stores/supermarkets. Marlboro Red (non-menthol) also cost more in convenience stores without gas and in the other establishment store type. Compared to the West, Newport Full Flavor (menthol) cost \$0.32 (95% CI = −0.46, −0.17) less in the South and \$0.36 (95% CI = −0.51, −0.20) less in the Midwest, whereas Marlboro Red (non-menthol) cost \$0.31 (95% CI = .16, 0.47) more in the Northeast, but \$0.24 (95% CI = −0.38, −0.10) less in the South and \$0.17 (95% CI = −0.33, −0.02) less in the Midwest. See Table 4 for a summary of retail menthol marketing from the mixed-methods modeling.

Interactions among census tract demographic characteristics—The interactions between census tract racial or ethnic group composition and median household income were not significant for all study outcomes ($p > .05$, results not shown).

Discussion

The findings of this study suggest that menthol cigarettes are marketed extensively in the retail environment, especially in neighborhoods with higher proportions of Black, Asian/PI, youth and lower-income residents. Disparities in menthol cigarette marketing varied by type of marketing and cigarette brand. In 2015, more than one-third of tobacco retailers displayed menthol advertising on their store exterior and more than two-thirds offered price promotions for menthol cigarettes. This is of concern as retail tobacco marketing has been associated with smoking uptake among youth as well as cravings and relapse among adult smokers. With approximately 375,000 tobacco retailers in the US, the public health harm incurred from exposure to retail tobacco marketing occurs frequently (Center for Public Health Systems Science, 2015; Author, 2017; Author, 2015; Author, 2016). Smokers come into contact with a tobacco retailer an average of 2.7 times per day (Kirchner et al., 2013). Almost half of US adolescents attend school within 1,000 feet of a tobacco retailer and visit convenience stores, the most common tobacco retailer, weekly (Author, 2015; Author, 2016). Furthermore, tobacco retailer density is higher in neighborhoods with more Black and lower-income residents, suggesting even greater exposure in these areas (Author, 2017).

Consistent with previous research (Gardiner & Clark, 2010; Author, 2015), retail menthol advertising was more common in neighborhoods with more Black and lower-income residents. These findings suggest that, when controlling for other neighborhood demographics, retail menthol advertising is targeted to neighborhoods with more Black residents, but not related to Asian/PI or Hispanic racial/ethnic group demographics. In the present study, the presence of exterior retail menthol advertising was not significantly associated with the percentage of youth in neighborhoods. Previous studies conducted in St. Louis, Missouri (Moreland-Russell et al., 2013) and California (Author, 2012), however, have found more retail menthol advertising in areas with greater proportions of Black youth. Comparison of study findings suggests retail menthol advertising may target Black youth, but not youth generally.

Price promotions for Newport menthol cigarettes were also more common in neighborhoods with more Black residents and this pattern was unique to the brand. Given the disproportionate retail advertising for menthol cigarettes and targeted use of Newport price promotions, it is not surprising that more than 80% of Black smokers use menthol cigarettes and Newport is the preferred brand (Glasser et al., 2016; Villanti et al., 2016). There was also evidence of targeted retail marketing for menthol price promotions in neighborhoods with more Asian/PI residents, but this was limited to promotions for Marlboro menthol cigarettes. Previous research has found more price promotions for Newport menthol cigarettes in neighborhoods with more youth in New York (Waddell et al., 2016) and California (Author, 2012), but there was no significant relationship with youth in the present study. This discrepancy may be due to methodological differences across studies. The New York study operationalized youth to include all children under 18 years old (Waddell et al.,

2016). The present study operationalized youth to include school-aged children 5 to 17 years old because retail marketing is more relevant to youth who are traveling to and from school (Author, 2016). The California sample was limited to tobacco retailers near high schools (Author, 2012). Comparison of study findings suggests that the tobacco industry may consider youth of all ages, and not just school-aged children, when determining retail marketing practices. In addition, there may be unique retail marketing practices for menthol cigarettes near schools.

The pack price of Newport Full Flavor (menthol) cigarettes was cheaper in neighborhoods with more Black, youth and lower-income residents. The Newport Full Flavor (menthol) pack price was cheapest in neighborhoods with the highest percentage of Black residents and the lowest median household incomes. Comparing marketing for Newport Full Flavor (menthol) and Marlboro Red (non-menthol) cigarettes helps identify where these leading brands' practices are similar or diverge. There was a more consistent pattern of a lower price for Newport Full Flavor (menthol) cigarettes in neighborhoods with more Black residents as compared to Marlboro Red (non-menthol) cigarettes. On the other hand, both brands were cheaper in neighborhoods with more individuals with low incomes and youth.

Findings from the present study can be compared to the first wave of data collection in 2012. Author et al. (2017) found price promotions for all tobacco products were more common in neighborhoods with more Black residents and youth. In the present study, price promotions for Newport menthol cigarettes were also more common in neighborhoods with more Black residents, but there was no relationship with the proportion of youth for price promotions of menthol cigarettes (Author, 2017). In addition, findings from the present study are generally consistent with a recent review on the relationship between retail cigarette marketing and neighborhood demographic characteristics (Author, 2015).

In the US, tobacco regulatory activity, including tobacco marketing restrictions and sales bans, can be enacted at local, state, and federal levels. In 2009, the Family Smoking Prevention and Tobacco Control Act gave authority to the FDA to regulate tobacco products at a federal level and placed several restrictions on tobacco marketing and products, including banning cigarettes with characterizing flavors. However, this ban specifically excluded menthol flavoring (Carvajal, Clissold, & Shapiro, 2009; Author, 2018). Public health researchers criticized the exclusion of menthol from federal regulations (Cheyne, Dorfman, Daynard, Mejia, & Gottlieb, 2014; Malone, 2017; Siegel, 2011; Warner & Schroeder, 2017). In 2017, at least 8 cities and counties (e.g., San Francisco, California, Minneapolis, Minnesota) have taken independent action and banned the sale of menthol cigarettes. Although San Francisco is an exception, most local policies only ban the sales of menthol in particular areas (e.g., around schools) or have exemptions (e.g., tobacco stores). Regulatory activity for menthol cigarettes is also occurring outside the US (Tobacco Control Legal Consortium, 2015). In 2015, Ethiopia banned the sale and distribution of any flavored tobacco product, including menthol. Turkey has implemented a ban on menthol as an additive. Provinces in Canada have also banned menthol tobacco products (Tobacco Control Legal Consortium, 2015).

Widespread, federal policies are needed that address disparities in retail menthol marketing in the US. Lange et al. (2015) note that placing restrictions on the size and total amount of retail marketing displays is legally viable. Permitting the display of only one package of each tobacco product in a tobacco display, for example, may help reduce disparities in retail marketing for menthol cigarettes and cut down on the large presence of retail advertising.

Banning the sales of menthol cigarettes near youth-concentrated areas such as near schools is another policy option that may help reduce disparities in retail menthol marketing among youth (Lange, Hoefges, & Ribisl, 2015). Policies focused on the price of menthol cigarettes are also needed to address retail marketing disparities. Restricting price promotions for menthol cigarettes that artificially lower the pack price may help reduce menthol marketing disparities, although it may be more appropriate to restrict price promotions for all tobacco products. Restrictions on retailer redemption of price promotions are legally more sound than restrictions on the manufacturer distribution of promotions (Lange et al., 2015). Minimum price laws, or legislation that places a minimum price at which a cigarette pack can be sold, may reduce consumption of cheaper menthol cigarette brands or those that fall within the discount brand category. Findings from this study suggest that such policies may reduce menthol cigarette consumption more in neighborhoods that have been targeted with price promotions and lower menthol cigarette prices such as those with a greater percentage of youth, Black and low-income residents (Author, 2014). Furthermore, previous studies suggest that these non-tax price policies may have a greater impact among price-sensitive consumers such as youth and individuals with low incomes as well as among Black smokers who are more likely to use price promotions (Author, 2016; Center for Public Health Systems Science, 2014). Going a step further, the FDA has the authority to ban all flavor characterizing additives, including menthol, at the federal level. Such a policy would have a strong pro-equity impact because youth, ethnic minority, and low-income smokers and those with serious mental illness are more likely to use menthol cigarettes (Corey et al., 2015; Villanti et al., 2016; Young-Wolff et al., 2015). Although more restrictive, banning the *sales* of menthol is considered a more promising legal approach as compared to banning menthol *advertising* (ChangeLab Solutions, 2010; Lange et al., 2015).

There has been a push to restrict retail cigarette marketing in general; however, it is unlikely such a policy would address disparities in retail marketing for menthol cigarettes. Restrictions on retail marketing for all cigarettes may result in less overall retail marketing, but without an explicit equity focus, are unlikely to impact disparities.

Although not the primary focus of this study, our findings highlight the paradoxical role of drug stores/pharmacies, stores that provide health care but also had the greatest odds of offering menthol price promotions and lower prices for Newport Full Flavor (menthol) cigarettes (Author, 2016). These findings are consistent with previous research showing pharmacies as a major venue for cigarette marketing (Author, 2016; Seidenberg, Hong, Liu, Noel, & Rees, 2013), and suggest that a tobacco-free pharmacy policy may help reduce the availability of menthol cigarettes sold at lower prices. In addition, overall, retail menthol marketing was less prevalent among tobacco retailers in the Western region of the US as compared to other regions. Federal policies that target retail menthol marketing may be particularly beneficial for US regions disproportionately targeted by such marketing. Finally,

there were no significant interactions between the neighborhood racial/ethnic composition and median household income demographic characteristics. Future studies should examine interaction effects in a sample of tobacco retailers that emphasizes these neighborhood demographic differences a priori.

These findings should be interpreted considering study limitations. Although the present study collected data on price promotions for the three leading cigarette brands, menthol cigarette exterior advertising was not collected by brand and the only price for menthol cigarettes was collected for Newport Full Flavor (menthol) cigarettes. In addition, the cross-sectional nature of the study precludes discussion of temporality. Thus, it remains unclear if the neighborhood variation in retail marketing is a result of the tobacco industry *responding* to consumer demand or the industry *driving* demand. The well-documented history of targeted marketing of menthol cigarettes to the African-American community in the US, in particular, suggests the latter may be more prominent (Gardiner, 2004). Also, the relationships between store neighborhood demographic characteristics and tobacco retail marketing may be stronger in places where tobacco control policies are relatively weak. Examination of the potential interactions among race, class, and place in geographic areas where this is possible may provide a more detailed understanding of the relationship between neighborhood demographic characteristics and tobacco retail marketing. Geographically-weighted regression models may be an effective approach to explore potential variation across the US in the relationships identified in this study, and may provide additional insight into where to target tobacco control policies. Finally, Alaska and Hawaii were not included in the present study due to the high cost of data collection, limiting generalizability to these areas. Strengths of this study include the representative sample of tobacco retailers in the contiguous US and the use of a standardized protocol for store audits and trained data collectors.

Even as smoking prevalence is decreasing in the US, prevalence of menthol cigarette use among smokers increased from 35% in 2008–2010 to 39% in 2012–2014 and these cigarettes are preferred by youth, ethnic minority, and low-income populations (Villanti et al., 2016). Findings from this study indicate the need for policies that address disparities in menthol retail marketing and cigarette use. Future studies should assess the potential equity impact of menthol marketing bans in the retail environment.

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Highlights

- • Menthol cigarettes are marketed extensively in the retail tobacco environment.
- • Menthol marketing targets areas with more youth, minority and low-income residents.
- • Price promotions in areas with more Black residents was unique to Newport.

Table 1.

Estimates of Tobacco Retail Marketing, Cigarette Pack Price, and Tobacco Retailer Store Type in the Contiguous United States, 2015

Variable	
Menthol Cigarette Advertising, %	37.7
Menthol Cigarette Price Promotion, %	
Any Promotion	69.3
Marlboro Promotion	50.1
Camel Promotion	48.0
Newport Promotion	27.6
Cigarette Single Pack Price, (US Dollars) ^c	
Newport Full Flavor (menthol)	\$5.19
Marlboro Red (non-menthol)	\$4.96
Neighborhood Demographics, mean % (SD)	
Black	12.7 (19.1)
Hispanic	17.8 (22.6)
Asian/Pacific Islander	4.9 (9.1)
Household income ^b	\$50,054.5 (\$37,816.0 - \$67,043.5)
Youth (aged 5 – 17)	16.4 (4.9)
Store Type, n (%) ^a	
	<i>N</i> = 2,124
Gas convenience store	898 (42.3)
Grocery store/supermarket	373 (17.6)
Convenience store without gas	214 (10.1)
Beer, wine, or liquor store	211 (9.9)
Mass merchandiser	203 (9.6)
Drug store/pharmacy	136 (6.4)
Tobacco shop	71 (3.3)
Other	18 (0.8)

Note.

^aSample size for retail stores and neighborhood demographics are unweighted. All other values are weighted.

^bMedian (IQR) in US Dollars

^cPrice has sales tax state tax and local excise taxes removed.

Table 2.
Predictors of Menthol Cigarette Advertising and Menthol Price Promotions, by Brand: United States, 2015

	Advertising n = 2,122		Newport n = 2,122		Price Promotions Marlboro n = 2,123		Camel n = 2,124	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Level 1								
Neighborhood (tract) Characteristics								
Black, %								
Q1: < 1.1	Ref		Ref		Ref		Ref	
Q2: 1.1 – 4.9	1.5	1.1, 2.0	1.3	1.0, 1.9	0.9	0.6, 1.2	1.0	0.7, 1.3
Q3: 4.9 – 15.2	1.3	1.0, 1.9	1.3	0.9, 1.9	1.2	0.8, 1.6	1.2	0.9, 1.7
Q4: 15.2 – 98.8,	1.9	1.3, 2.7	1.8	1.2, 2.7	0.7	0.5, 1.0	1.0	0.6, 1.4
Asian/PI, %								
Q1: 0.3	Ref		Ref		Ref		Ref	
Q2: 0.3 – 1.6	0.9	0.7, 1.2	1.0	0.7, 1.3	1.1	0.8, 1.5	1.0	0.8, 1.4
Q3: 1.6 – 5.2	0.9	0.6, 1.2	0.9	0.7, 1.3	1.3	0.9, 1.8	1.0	0.7, 1.3
Q4: 5.3 – 86.0	0.9	0.6, 1.2	1.0	0.7, 1.5	1.6	1.1, 2.4	0.8	0.5, 1.1
Hispanic, %								
Q1: < 2.8	Ref		Ref		Ref		Ref	
Q2: 2.8 – 8.1	1.0	0.8, 1.4	0.9	0.7, 1.3	1.3	0.9, 1.8	1.1	0.8, 1.5
Q3: 8.1 – 22.7	1.0	0.7, 1.4	0.9	0.6, 1.3	1.4	0.9, 2.0	1.1	0.7, 1.6
Q4: 22.8 – 99.5	0.9	0.6, 1.4	0.9	0.6, 1.3	1.1	0.7, 1.7	0.9	0.6, 1.4
Population 5 – 17 years, %								
Q1: < 13.7	Ref		Ref		Ref		Ref	
Q2: 13.7 – 16.6	1.1	0.8, 1.5	0.9	0.7, 1.3	1.4	1.0, 1.9	1.0	0.7, 1.4
Q3: 16.6 – 19.7	1.2	0.8, 1.5	0.9	0.7, 1.3	1.2	0.9, 1.6	0.9	0.7, 1.3
Q4: 19.7 – 32.3	1.0	0.7, 1.3	0.9	0.7, 1.3	1.3	0.9, 1.8	0.8	0.6, 1.1
Median household income, \$ ^a								
Q1	Ref		Ref		Ref		Ref	
Q2	1.3	1.0, 1.7	0.9	0.7, 1.2	0.8	0.6, 1.1	0.9	0.6, 1.2
Q3	1.4	1.0, 1.9	0.9	0.7, 1.3	0.8	0.6, 1.1	0.9	0.7, 1.2
Q4	1.6	1.2, 2.2	1.0	0.7, 1.4	0.8	0.6, 1.1	0.7	0.5, 1.0

Store Type	Advertising n = 2,122		Newport n = 2,122		Price Promotions Marlboro n = 2,123		Camel n = 2,124	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Gas convenience store	Ref		Ref		Ref		Ref	
Convenience store without gas	0.7	0.5, 1.0	1.0	0.7, 1.5	0.5	0.4, 0.7	0.5	0.4, 0.8
Drug store/pharmacy	0.0	0.0, 0.0	6.5	4.1, 10.3	8.5	4.2, 17.0	2.2	1.4, 3.7
Beer, wine, liquor	0.3	0.2, 0.4	0.3	0.2, 0.4	0.1	0.1, 0.2	0.1	0.1, 0.1
Grocery store/supermarket	0.1	0.1, 0.2	0.3	0.2, 0.5	0.4	0.3, 0.5	0.1	0.1, 0.2
Mass Merchandiser	1.5	1.1, 2.1	0.4	0.3, 0.6	0.4	0.3, 0.6	0.1	0.0, 0.1
Tobacco Shop	1.7	1.0, 2.9	0.7	0.4, 1.3	0.9	0.5, 1.5	0.7	0.4, 1.2
Other establishment type	0.7	0.2, 1.9	0.4	0.1, 1.6	0.2	0.1, 0.7	0.1	0.0, 0.5
Level 2 (n = 97 counties)								
Region								
West	Ref		Ref		Ref		Ref	
South	1.3	0.8, 2.1	1.5	0.9, 2.7	2.3	1.1, 4.7	1.5	0.9, 2.5
Midwest	1.7	1.0, 2.8	1.1	0.6, 2.1	1.4	0.6, 3.0	2.0	1.1, 3.6
Northeast	1.9	1.1, 3.2	1.1	0.6, 2.0	0.6	0.3, 1.4	0.8	0.4, 1.4

Note. Bold text indicates $p < .05$. Asian/PI = Asian or Pacific Islander.

^aMedian household income was standardized at the county level and ordered from highest to lowest.

Table 3.
Predictors of Newport Full Flavor Menthol and Marlboro Red Non-menthol Cigarettes Single Pack Price

	Newport Full Flavor (menthol) Pack Price		Marlboro Red (non-menthol) Pack Price	
	B	95% CI	B	95% CI
Intercept	555.7	540.1, 571.2	517.4	503.0, 531.8
Level 1				
Neighborhood (tract) Characteristics				
Black, %	Ref		Ref	
Q1: < 1.1				
Q2: 1.1 – 4.9	-9.1	-16.1, -2.1	-8.4	-14.3, -2.4
Q3: 4.9 – 15.2	-8.1	-15.6, -0.5	-3.8	-10.3, 2.7
Q4: 15.2 – 98.8	-18.3	-26.8, -9.8	-5.0	-12.4, 2.4
Asian/PI, %				
Q1: 0.3	Ref		Ref	
Q2: 0.3 – 1.6	-2.7	-9.4, 3.9	0.1	-5.6, 5.8
Q3: 1.6 – 5.2	5.8	-1.3, 12.9	3.3	-2.8, 9.5
Q4: 5.3 – 86.0	10.6	2.3, 18.9	5.6	-1.6, 12.9
Hispanic, %				
Q1: < 2.8	Ref		Ref	
Q2: 2.8 – 8.1	-0.5	-7.6, 6.6	-5.2	-11.4, 1.0
Q3: 8.1 – 22.7	-2.6	-10.9, 5.8	-5.8	-13.1, 1.5
Q4: 22.8 – 99.5	-5.2	-14.9, 4.5	-5.4	-14.0, 3.2
Population 5–17 years, %				
Q1: < 13.7	Ref		Ref	
Q2: 13.7 – 16.6	-6.1	-12.6, 0.4	-6.6	-12.2, -1.0
Q3: 16.6 – 19.7	-12.3	-18.9, -5.6	-8.4	-14.1, -2.7
Q4: 19.7 – 32.3	-9.0	-15.9, -2.1	-10.5	-16.5, -4.6
Median Household Income, \$ ^a				
Q1	Ref		Ref	
Q2	-9.5	-16.1, -3.0	-7.4	-13.0, -1.7
Q3	-6.7	-13.4, -0.0	-6.8	-12.5, -1.1

	Newport Full Flavor (menthol) Pack Price	Marlboro Red (non-menthol) Pack Price
Q4	-15.4	-22.5, -8.2
Store Type		
Gas convenience store	Ref	Ref
Convenience store without gas	0.5	-7.8, 8.7
Drug store/pharmacy	-14.0	-23.4, -4.6
Beer, wine, liquor	22.5	14.2, 30.8
Grocery store/supermarket	38.5	31.9, 45.0
Mass Merchandiser	-25.4	-33.4, -17.4
Tobacco Shop	-15.2	-27.9, -2.5
Other establishment type	1.7	-27.4, 30.7
Level 2 (n = 97 counties)		
Region		
West	Ref	Ref
South	-31.5	-45.9, -17.1
Midwest	-35.7	-51.4, -20.0
Northeast	1.7	-14.3, 17.6
		31.3
		15.5, 47.0

Note. Bold text indicates $p < .05$. Asian/PI = Asian or Pacific Islander. Pack price is in cents and has sales tax and state and local excise taxes removed.

^aMedian household income was standardized at the county level and ordered from highest to lowest.

Table 4.

Summary of Retail Cigarette Marketing Results by Neighborhood Demographic Characteristics

	Census Tract Residents				
	Black	Asian/PI	Hispanic	Youth	Lower Income
Exterior Menthol Advertising	X				X
Newport Menthol Promotion	X				
Marlboro Menthol Promotion		X			
Camel Menthol Promotion					
Newport Full Flavor (menthol) Pack Price	X			X	X
Marlboro Red (non-menthol) Pack Price				X	X

Note. Asian/PI = Asian or Pacific Islander. Pack price has sales tax and state and local excise taxes removed. Median household income was standardized at the county level.